# OPINION 2283 (Case 3390)

## *Archaeopteryx lithographica* von Meyer, 1861 (Aves): conservation of usage by designation of a neotype

**Abstract.** The Commission has set aside all previous type fixations for the nominal species *Archaeopteryx lithographica* von Meyer, 1861 and designated a feathered specimen (BMNH 37001) in the Natural History Museum, London as the neotype. The holotype (a feather impression) was not identifiable to species and could belong to any taxon of fossil birds recognised from the Solnhofen limestone.

**Keywords.** Nomenclature; taxonomy; Aves; *Archaeopteryx*; *Archaeopteryx lithographica*; neotype; Solnhofen; Jurassic.

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### Ruling

(1) Under the plenary power it is hereby ruled that all previous type fixations for the nominal species *Archaeopteryx lithographica* von Meyer, 1861 are set aside and specimen BMNH 37001 at the Natural History Museum, London is designated as the neotype.

(2) It is hereby ruled that both the generic and specific names *Archaeopteryx* and *lithographica* were made available by von Meyer, 1861 in '*Archaeopterix lithographica* (Vogel-Feder) und *Pterodactylus* von Solenhofen. *Neues Jahrbuch für Mineralogie, Geognosie, Geologie und Petrefakten-Kunde*, p. 679.'

(3) The entries in the Official List of Generic Names in Zoology and the Official List of Specific Names in Zoology for the names *Archaeopteryx* von Meyer, 1861 and *lithographica* von Meyer, 1861, as published in the binomen *Archaeopteryx lithographica*, are hereby emended to record the neotype designation as in (1) above and the date and pagination as in (2) above.

### History of Case 3390

An application to preserve stability and universality of usage of the name *Archaeopteryx lithographica* von Meyer, 1861 by setting aside the existing holotype and designating a neotype, was received from Walter J. Bock (*Columbia University, New York, NY, U.S.A.*) and Paul Bühler (deceased, formerly of *University of Stuttgart-Hohenheim, Stuttgart, Germany*) on 5 June 2006. After correspondence the case was published in BZN **64**: 182–184 (December 2007). The title, abstract and keywords of the case were published on the Commission's website. Comments (seven supporting, one opposing) were published in BZN **64**: 261–262, **65**: 314–317 (with additional proposals), **66**: 87–88, **66**: 357–358; **67**: 90–93, **67**: 179. An additional comment correcting the page reference for the name was received and circulated before the vote; this will be available on the Commission website.

### Decision of the Commission

On 1 March 2011 the members of the Commission were invited to vote on the original set of proposals published in BZN **64**: 184 and the modified set of proposals

in BZN **65**: 317 (which included the original two proposals as 1 & 3 and the addition of proposal 2 as reflected in the ruling above). At the close of the voting period on 1 June 2011 the votes were as follows:

Original proposals:

Affirmative votes – 14: Ballerio, Bouchet, Brothers, Grygier, Harvey, Krell, Kullander, Lamas, Pape, Rosenberg, Štys, Winston, Yanega and Zhang.

Negative votes – 8: Halliday, Kojima, Minelli, Ng, Papp, Patterson, van Tol and Zhou.

Bogutskaya split her vote, Fautin abstained. Alonso-Zarazaga, Kottelat, Lim and Pyle were on leave of absence.

Modified proposals:

Affirmative votes – 20: Ballerio, Bogutskaya, Bouchet, Brothers, Fautin, Halliday, Harvey, Kottelat, Krell, Kullander, Lamas, Minelli, Ng, Papp, Patterson, Rosenberg, Štys, van Tol, Winston, Yanega, and Zhou.

Negative votes – 2: Kojima and Pape,

Grygier split his vote, Fautin abstained. Alonso-Zarazaga, Kottelat, Lim and Pyle were on leave of absence.

As the modified proposals have passed, and include all of the content of the original proposals, this decision is taken as binding for both sets of proposals.

Voting FOR both sets of proposals, Brothers said that it seemed eminently sensible to ensure clarity in the application of this famous name, which was not possible from the current holotype, and designation of the requested neotype would accomplish this. The elimination of ambiguities in its attribution was also assisted by confirmation as to the publication in which the names were made available. Also voting FOR both sets of proposals, Lamas commented that, based on the evidence available, the proposals initially suggested by Bock & Bühler, ably improved by Kadolsky, appeared to him to be the simplest and most rational solution. Voting FOR both sets of proposals Rosenberg said that some of the published comments on this case suggested hypothetical scenarios. One scenario was that detailed anatomical and morphometric study would show all of the feather-bearing nominal species known from Solnhofen are synonymous, in which case a neotype would not be necessary (i.e. given time, the case would resolve itself). Another is that future discoveries would show unequivocally that more than one feather-bearing species occurred at Solnhofen (i.e. sooner or later a neotype would be needed). He pointed out that while these scenarios were both reasonable, the Commission must deal with the current situation, not hypothetical ones. If only one nominal species had so far been described from Solnhofen, Rosenberg said he would agree that designation of a neotype was premature, but the current situation was that some workers considered there to be only one feather-bearing species at Solnhofen whereas others regard there to be more than one. As an example of the latter he cited Senter & Robins (2003, *Journal of Vertebrate Paleontology*, **23**: 961–965), who did a morphometric analysis on six *Archaeopteryx* skeletons, but a priori excluded the specimen assigned to *Wellnhoferia* 'due to the specimen's unique pedal and caudal characteristics'. Therefore, Rosenberg regarded designation of a neotype as necessary. Štys, who voted FOR both sets of proposals, said that it was unclear how to vote against the first set of proposals since the first set of proposals was actually only a subset of the second. He suggested a better formulation would have been to vote on whether (b)

**Fig. 1.** *Archaeopteryx lithographica* (neotype BMNH 37001, the Natural History Museum, London). ©The Natural History Museum, London image 001233. Length of tibiae (for scale) 80.7 mm.

should be included or not. On the content of the Case, he said he thought that the whole specimen was better as the name-bearing type than a non-identifiable feather, particularly since no change of name and no alteration of taxonomic concept was involved. Winston, voting FOR both sets of proposals, said that the modified set

seemed necessary as a comment on the details of the process by which the name became available. Yanega, voting FOR both sets of proposals, said it was quite clear to him that the London specimen had long been taken, in practice, as the de facto type of *A. lithographica*. He thought it seemed perfectly sensible to formalise this unambiguously, as well as to resolve any ambiguities regarding the publication that made the name available, to forestall any future controversy.

Grygier, voting FOR the first set of proposals and splitting his vote for the second set of proposals as FOR 1, AGAINST 2 & 3, explained that statement 1 is identical in both sets of proposals, and that he felt there seemed to be no need for Kadolsky's additional proposal 2 in the modified set as *Archaeopteryx* and *lithographica* are already available from the specified von Meyer work of 1861 by virtue of their being listed as such in the respective Official Lists (Article 80.4 of the Code). The plenary power would be needed to change this status, not to maintain it.

Ng, voting AGAINST the first set and FOR the second set of proposals, commented that the Case explained the controversial history for an extremely important fossil and a very widely used name. He felt that it made sense that the Commission should now fix the author (as it had always been recognised) and select a neotype that had been the basis of what the name was. He added that he felt it might not be the best approach in a legal framework, but it was the right thing to do for nomenclatural stability nevertheless.

Van Tol, voting AGAINST the original set of proposals and FOR the modified set of proposals, said that incomplete type specimens did not usually hamper progress in taxonomy. In most groups consensus was reached on the identity of the nominal taxa based on the opinion of experts after studying type material or descriptions. Apparently, students of fossil birds preferred a better preserved specimen for the nominal taxon *Archaeopteryx lithographica*, while the proposed neotype had been considered the type for many years. Although strictly there was no reason for action by the Commission, the modified proposal actually preserved present practice.

Voting AGAINST both sets of proposals, Kojima commented that the proposal did not mention explicitly why the stability or universality of *Archaeopteryx lithographica* were threatened. Even if the existing name-bearing type (feather impression) could not determine the taxonomic identity of *Archaeopteryx lithographica*, as mentioned in paragraph 8, neither its stability nor universality were threatened.

## Original reference

The following is the original reference to the name amended on Official Lists by the ruling given in the present Opinion:

*lithographica*, *Archaeopteryx*, von Meyer, 1861, *Neues Jahrbuch für Mineralogie, Geognosie, Geologie und Petrefakten-Kunde*, **1861**(6): 679.